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Introduction

The following use cases define the main success scenarios for establishing an FMU (fire management unit). The first use case is a summary of the detail use cases that follow. The use cases assume a single, shared process for all agencies. The Local Agency Fire Planner is the role played by the person responsible for fire planning within a local agency. Since the SuD may be used by multiple agencies, this role may be played by multiple persons within the FPU. It may be common practice to define FMUs as a way to determine the most effective grouping of FMUs within an FPU. FMU type is a data attribute that may help to define the unique attributes of an FMU within an FPU. FMU type is only conceptually defined at this point in the analysis.

Summary Use Case

Use Case No: FPA01-02

Use Case Name: **Define Fire Management Unit**

Brief Description: ***Define and describe a Fire Management Unit (FMU).***

Primary Actor: Local Agency Fire Planner
Preconditions: Fire management objectives are defined.
Triggers: Local Agency Fire Planner is ready to define FMUs.

Main Success Scenario:
1. Local Agency Fire Planner(s) delineate fire managements units (FMUs) as contiguous blocks of land based on natural/cultural resource objectives and/or other considerations, and fire management objectives within the FPU.
2. Local Agency Fire Planner(s) define FMU fuel conditions.
3. Local Agency Fire Planner(s) define FMU historic fire data.
4. Local Agency Fire Planner(s) define FMU objectives.
5. Local Agency Fire Planner(s) weight an FMU by the relative importance in protecting acres from being burned within the FPU based on FMU resources and objectives.

Alternate Flow of Events:
   1a FMU data is available as spatial, digital data layers.
       1a 1 Local Agency Fire Planner(s) import spatial, digital data.

Policy Recommendations: None
Business Rules:
1. From the interagency Fire Management Plan Template definition: An FMU is any land management area definable by objectives, management constraints, topographic features, access, values to be protected, political boundaries, fuel types, major fire regime groups, and so on, that set it apart from the management

characteristics of an adjacent FMU. The FMUs may have dominant management objectives and pre-selected strategies assigned to accomplish these objectives. The development of FMUs should avoid redundancy. Each FMU should be unique as evidenced by management strategies, objectives and attributes.

2. The FMU is related to one and only one set of fuel conditions and weather data for one specific analysis.
3. An FMU is represented by a single polygon.
4. The FMU is the basic unit of analysis.
5. An FMU Type field will be added to the FMU to facilitate comparison of FMUs within a planning unit and across planning units. FMU type would define similarity based on predefined attributes. FMU Type could be a function of condition class, fuels, topography, cover, etc. This will help to standardize the process.
6. FPA System PM will use the FMU definition from Fire Management Plan (FMP) template.
7. An FMU maybe included in multiple FPUs to determine efficiencies between FPUs.
8. Fire behavior data is considered to be the same throughout the FMU for a given outyear budget analysis.

Assumptions:
- Fuel conditions and historic fire data may be available as digital spatial layers. This data can be imported into the SuD.

Issues:
- Is the single set of fuel conditions and weather data within an FMU apply to a single ignition? Will this change if the SuD uses multiple ignitions within an FMU for a given analysis?

Terms: None

Metadata:

Source:	Requirements Analysis
Author:	Core Team
Date Created:	October 9, 2002
Level:	Business - Summary
Related Use Cases:	FPA01-00, FPA01-02-01, FPA01-02-02, FPA01-02-03, FPA01-02-04
Status:	Updated by M. Tae
Last Update Date:	January 22, 2003

Detail Use Cases

Use Case No: FPA01-02-01

Use Case Name: **Define FMU Boundaries**

Brief Description: ***Define boundaries for the FMU.***

Primary Actor: Local Agency Fire Planner
Preconditions: Landscape data is available.
Triggers: None identified

Main Success Scenario:
1. Local Agency Fire Planner(s) determine the fuel conditions, objectives (values to be protected), average annual dispatch response time, and political boundaries within a proposed or actual FPU.
2. Local Agency Fire Planner(s) define FMU boundaries.

Policy Recommendations: None
Business Rules:
1. All FMUs will be included in at least one FPU and may be included in multiple FPUs.
2. An FMU can be in only one FPU for any given budget request.
3. Every acre within a planning unit must be included within at least one FMU. FMUs are contiguous.
4. An FMU will consist of only one polygon.

Assumptions:
*   If the SuD uses geospatial data, then some of the FMU constraints (roadless area, etc.) could be modeled by constraining a fire resources' ability to be deployed within specific landscapes (by slope, objectives, etc.) rather than defining constraints tabularly.

Issues: None
Terms: None
Metadata:
       Source: Requirements Analysis
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       Level: Business - Detail
       Related Use Cases: FPA01-02
       Status: Reviewed by Core Team
       Last Update Date: January 22, 2003

Use Case No: FPA01-02-02

Use Case Name: **Define FMU Fuel Conditions**

Brief Description: ***Define fuel conditions across the planning unit.***

Primary Actor: Local Agency Fire Planner
Preconditions: Planning Unit and FMU must be defined.
Triggers: None identified

Main Success Scenario:
1. Local Agency Fire Planner(s) identify the FMU.
2. Local Agency Fire Planner(s) define the fuel model(s) and fuel type.
3. Local Agency Fire Planner(s) define the fire regime and condition class.

Alternate Flow of Events:
   2a Data is available as a digital, spatial data layer.
       2a 1 Local Agency Fire Planner(s) import data to the SuD.

Policy Recommendations: None
Business Rules:
   - FPA will use the condition class definition as documented in the Cohesive
     Strategy.
   - FPA will use the fire regime definition as documented by Bunnell and Hahn.

Assumptions:
   - FPA System PM will use the Fire Behavior Prediction System.

Issues:
   - Is the definition of fire regime acceptable to all agencies?

Terms:
   - Cohesive Strategy: undefined.
   - Bunnell and Hahn: undefined.

Metadata:
   Source: Requirements Analysis
   Author: Core Team
   Date Created: October 9, 2002
   Level: Business - Detail
   Related Use Cases: FPA01-02
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Use Case No: FPA01-02-03

Use Case Name: **Define FMU Historic Fire Data**

Brief Description: ***Assemble fire occurrence and weather data for an FMU.***

Primary Actor: Local Agency Fire Planner
Preconditions: Historic fire data exists.
Triggers: A need to simulate fire behavior is identified.

Main Success Scenario:
1. Local Agency Fire Planner(s) define the historic fire period.
2. Local Agency Fire Planner(s) enter the topographic, fire event and weather data for the historic fire period.
3. SuD calculates the fire intensity level and rate of spread by the hour using the weather data, fuel data and topographic data.

Alternate Flow of Events:
2a Fire occurrence data resides in an external system.
    2a 1 Fire occurrence data from the external system is imported into FPA.
2b Weather data resides in an external system.
    2b 1 Weather data from external system is imported into FPA.
2c Topographic data resides in an external system.
    2c 1 Topographic data is imported into FPA from the external system.

Policy Recommendations:
- Historic fire and weather data for all agencies will conform to a data standard. PCHA is now the standard for BLM, USFS and BIA.

Business Rules:
1. Fire behavior data is considered to be the same throughout the Fire Management Unit for a given outyear budget analysis.
2. FPA will contain the functionality to import historic fire occurrence and weather data from PCHA or other external systems that conform to the PCHA format.
3. Weather and topographic data may be imported from PCHA or another external system.
4. Historic fire occurrence data consists of the number and location of ignitions, and for each fire: the number of acres burned, the FIL and the associated weather data.
5. The weather station default is NFDRS but could be replaced by another local source.
6. Weather variable data standards will be NFDRS, e.g. wind measured at 20 ft.
7. Any weather station can be used as long as the metadata are known.
8. NIFMID – (National Interagency Fire Management Integrated Database) may be used as a source of fire occurrence data.
9. FPA System will use either NIFMID or Climate Centers weather data.

Assumptions: None

Issues:
- What are the minimum required data elements required to document a fire event for the FPA System, including the standard method of collecting the data?

Terms: None

Metadata:

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Use Case No: FPA01-02-04

Use Case Name: Define FMU Objectives and Weight

Brief Description: Identify fire management objectives and assign a weight.

Primary Actor:	Local Agency Fire Planner
Preconditions:	None identified
Triggers:	None identified

Main Success Scenario:
1. Local Agency Fire Planner(s) identify valid objectives in the FMP or other policy direction for the FMU.
2. Local Agency Fire Planner(s) collaborate with the interagency and/or interdisciplinary teams to validate fire program analysis objectives and weights and to identify shared interests.
3. Local Agency Fire Planner(s) define objectives for each FMU.
4. Local Agency Fire Planner(s) assign a weight by FMU.
5. SuD validates proportional weighting of all FMUs.

Policy Recommendations:
- Local Agency units will conduct an annual program review prior to the budget request process.

Business Rules:
1. Weights for the FMU should be developed in consultation with the interagency and /or interdisciplinary team that represents the interests of all the stakeholders.
2. There is only one weight per hour (FIL) per FMU.
3. Weights are proportional and define a ratio of relative importance of meeting fire management objectives.
4. FMU objectives are summarized from the Fire Management Plan and are based on land management objectives.

5. FMU Objectives are stated as the allowable number of acres burned by FIL by time of year within the FMU.
6. The FPA System will record when the simulated fire exceeds the objective within the FMU.
7. FPA will determine the degree that an objective is met at a budget level. Optimization will accomplish this through a slack variable.
8. FPA will use the FMU weights to drive the optimization.
9. The weights and objectives are the result of negotiations between competing interests within the FMU. The FPA system will not reconcile differences in objectives; this is an organizational process.
10. The Agency unit will be responsible for translating resource management goals and objectives into fire management goals and objectives. FPA will not develop this process or support it through the software application. FPA will define categories of objectives and what the objective needs to look like to run the model.

Assumptions: None

Issues:
1. How will the model use FMU weights?
2. How will FILs be reflected in the assignment of objectives and weighting?
3. Is the objective a measure by incident or annually?
4. Can objectives be categorized qualitatively, to allow tracking back to the FMP, LMP?
5. How will the model use time of year when included in the FMU objectives, e.g. seasons?
6. Can we develop a set of default objectives? Example: Manage for late successional reserve relates to minimizing a specific number of acres burned.

Terms: None

Metadata:

Source:	Requirements Analysis
Author:	Core Team
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